5/PRTS

BASE ASSEMBLIES, METHODS OF PRODUCTION AND USES THEREOF

This application claims priority to United States Provisional Application Number 60/400935 filed on August 1, 2002, and is incorporated herein in its entirety.

FIELD OF THE SUBJECT MATTER

The field of the subject matter is base assemblies and base structures for use as a support and transport mechanism in industrial and commercial applications.

BACKGROUND

The telecommunications and data industries have grown exponentially in the last 5 to 8 years partly because both industries have been able to expand their customer base from customers that are close to the center of operations/transmissions to customers who are located a significant distance from the center of operations/transmissions. Expansion of data transmissions to customers located at significant distances from the center of operations is facilitated by remote sites that are portable and smaller than the center of operations site. The telecommunications and data communications industries include those utilities and industries that provide one-way and two-way data transmission and transportation. The telecommunications industry also includes wireless communications, wire-based communications and combinations thereof. Wireless communications includes infrared, satellite, antennae, etc. Wire-based communications includes fiber optic cable, conventional cable, coax cable, shielded and unshielded twisted pair cable, etc.

Remote sites usually contain electrical and telecommunications wiring and components, such as batteries, antennae, circuit boards, keypads and other related components that in many cases can be fragile, relatively inaccessible and certainly sensitive to the elements and other environmental conditions. Therefore, these remote sites should be

enclosed or otherwise contained in a protective enclosure system and should be relatively easy to assemble, move and relocate, if necessary, without damage to the internal components and wiring.

Remote sites and enclosure systems should be monitored to determine if a need exists for environmental control and to what degree environmental control should be implemented, if needed. The enclosure systems may also need to be relocated in order to implement any new environmental controls or to remove any environmental hazards from the remote enclosure or site.

Also, the enclosure system, remote enclosure system and/or remote site should be easy to access and easy to initially assemble and relocate. Often times, in conventional remote enclosure systems, some components will be easy to access, swap out and repair; but other components will be difficult, if not impossible, to access without moving other components around or removing them altogether. The remote enclosure system may also need to be moved or otherwise relocated to repair or to upgrade/swap-out the components. The process of repairing, replacing or accessing difficult to access components can be made more difficult depending on the site location of the remote enclosure system and the environmental conditions surrounding the remote enclosure system, which is why some enclosure systems must be moved or otherwise relocated in order to repair, replace or access some components.

With remote enclosure systems, one conventional method of lifting and moving the system is to attach a rigging apparatus to the top of the enclosure system by eye bolts and lift it with a crane, boom truck or other large moving device or apparatus. Another commonly used method of lifting and moving the system is to use a forklift device with the cabinet or enclosure system sitting on a wooden pallet. Pallets normally used are unstable for long-term use and storage of the remote enclosure system and can be altogether inappropriate for some enclosure systems, such as those that are oversized, unusually heavy or otherwise difficult to control when moving using conventional moving systems.

Another issue that is common with remote enclosure systems and cabinet systems is that because of design constraints or modifications, the systems need to be assembled at or close to the remote site in order to accommodate the design constraints or modifications or in

order to accommodate other issues with the cabinet and/or system. These issues can be difficult when factoring in environmental conditions or other conditions, such as the condition of the site or the remote location.

Other industries, such as the wine, liquor, beer and food processing industries, the chemical manufacturing industry and the pharmaceuticals industries, have issues with relocating, adjusting and/or otherwise moving vats, processing containers, starting materials and other equipment. Generally, equipment and materials are located on top of a pallet or the equipment is physically bolted in place to the floor. As mentioned, pallets are unstable for long-term use and storage of the equipment and can be altogether inappropriate for some equipment and/or materials, such as those that are oversized, unusually heavy or otherwise difficult to control when moving using conventional moving systems and/or that equipment that must be consistently relocated to be cleaned, repaired or used elsewhere in the process. The equipment that is directly bolted to the floor is generally more stable than that equipment located on a pallet, but equipment bolted directly to the floor can be difficult to transport once the bolts are removed, because the equipment may be oversized or otherwise difficult to move because of the shape of the equipment.

Therefore, there is still a need in industry for a base assembly that a) can be directly coupled and/or fixed to the equipment and/or materials being supported by the base assembly; b) can remain stable despite the weight and/or size limitations of the equipment and/or materials; c) can be easily used with conventional moving equipment, such as forklifts; d) can provide consistent aeration and reasonably dry conditions under the load component; and e) can be readily expanded, as needed, to accommodate additional equipment and/or materials.

SUMMARY OF THE SUBJECT MATTER

The subject matter described herein is directed to a base assembly that includes: a) a frame system; b) a plurality of receiving members coupled to the frame system; and c) at least one coupling apparatus, whereby the coupling apparatus is designed to couple or facilitate the coupling of the base assembly to a load component.

The subject matter described herein also is directed to a load assembly that includes: a) a base assembly described herein; and b) a load component.

Methods of producing a load assembly include a) providing a base assembly; b) providing a load component; and c) coupling the base assembly and the load component. Methods of using a load assembly include a) using a base assembly; b) using a load component; and c) coupling the base assembly and the load component.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a contemplated base assembly system.

Fig. 1A shows a contemplated coupling member and/or apparatus.

Fig. 2 shows another contemplated embodiment of a base assembly system.

Fig. 3 shows a contemplated frame system.

Fig. 4 shows another contemplated frame system.

Fig. 5 shows contemplated components of a frame system.

DETAILED DESCRIPTION

In order to facilitate assembling and relocating load components, such as remote access enclosure systems, remote enclosure systems, radio-equipment cabinets and enclosures and other types of similar systems and enclosures, and equipment and materials used in the wine, beer, liquor or food processing industries, chemical industry and/or pharmaceutical industry, a base assembly system has been developed that allows for easy assembling, lifting, moving, relocating and placement of the systems, equipment, materials and cabinets previously mentioned. Contemplated base assemblies a) can be directly coupled to the equipment and/or materials being supported by the base assembly; b) can remain stable despite the weight and/or size limitations of the equipment and/or materials; c) can be easily used with conventional moving equipment, such as forklifts; d) can provide consistent aeration and reasonably dry conditions under the load component; and e) can be readily expanded as needed, and in come cases expanded *in situ* to accommodate additional equipment and/or materials.

The base assembly system contemplated herein comprises a frame system and a plurality of receiving members, such as reinforced tubes, that accommodate the forks of a fork lift or other similar apparatus or device so that the cabinet or enclosure system can be easily lifted and placed at any suitable site or location. The base assembly system also comprises at least one coupling apparatus that is designed to couple the base assembly system to the load component. Load components, such as remote enclosure systems, enclosure systems and cabinet systems, that are easily coupled to the base assemblies contemplated herein are those found in US Provisional Application Serial No.: 60/379480, those manufactured by Purcell Systems, Inc. and similar manufacturers, and those used by Nokia and similar telecommunications companies.

Figure 1 shows a contemplated base assembly system 10 coupled to a load component 50. As shown, the contemplated base assembly system 10 comprises a frame system 20 and two receiving members 30. The base assembly system 10 further comprises a plurality of coupling members or apparatus 40 that, in this embodiment, are nut and hex bolt assemblies, wherein the nut 42, bolt 44 and washer 46 are shown blown up **Figure 1A**. The coupling apparatus 40, in this embodiment, fit through holes 48 and 52 that are drilled into the frame system 20 and/or the receiving members 30 (holes 48) and the load component 50

(holes 52). In this embodiment, the load component 50 comprises a remote enclosure system or cabinet. In additional embodiments, the frame system 20 may be anchored to the floor, a concrete slab or underlying surface 60 by using any suitable anchoring device, such as anchor bolts, weights, adhesives, magnets, screws or any combination thereof (not shown). Holes 62 are shown in **Figure 1** that are designed to be used to anchor the base assembly 10 to the floor 60, if necessary. **Figure 2** shows another contemplated embodiment of the subject matter disclosed herein. In this Figure, a contemplated load component 150, which can be described as a vat or drum, is shown with a modified base assembly system 110 comprising a frame system 120, receiving members 130 and coupling apparatus 140. It should be understood that, especially in Figure 1, the receiving members, along with the frame system, provide some of the support for the load component. In other words, in most of the contemplated embodiments, some of the downward force of the load component, when stationary or when being transported, is distributed along the frame system and the receiving members.

Both **Figures 1 and 2** show several contemplated frame systems; however, the frame system may generally comprise any suitable design, as long as the design goals of the frame system are met. Those design goals are: a) support or lock into place the receiving members; b) support the load component during movement; c) support the load component when stationary; and d) allow for expandability when additional load components or different load components are utilized. For example, the frame system may comprise a rectangular, square, triangular, diamond, pentagon, hexagon or other suitable shape and may further comprise at least one crossbeam, as shown in Figure 3. **Figure 3** shows a frame system 220 that comprises four beams 222 coupled to form a rectangular frame system, as opposed to the parallel beam frame system shown in Figure 1. Crossbeam 224 is added to the frame system 220 to provide additional support for a load component (not shown). **Figure 4** shows a frame system 320 that comprises six beams 322 coupled to form a hexagonal frame system. Crossbeams 224 are added to the frame system 320 to provide additional support for a load component (not shown).

It should be appreciated that all of the beams may be coupled to one another by any suitable manner, including soldering, bolts, adhesives, molding, grips or a combination thereof. It should be further appreciated that although several contemplated embodiments

list, for example, four (4) beams 222 and 322, that they may be coupled together before assembly of the frame system to form one (1) square or rectangular frame. As used herein, the term "mold" or "molding" is used to describe the process whereby a material is either physically shaped or poured into a mold to form a particular and/or contemplated shape, structure or component. It should also be appreciated that what appears in the frame system as four (4) beams 222 or 322 may be four (4) beams 422, two (2) sets of beams at 90° angles to one another coupled together 432 or one (1) square or rectangular beam assembly 434. (see **Figure 5**) As used herein, the term "coupled" can be defined as fastening or otherwise joining two or more components together. It is intended that the action of "coupling" the base assembly system to another component can take place by using any suitable coupling device, composition, compound or apparatus, such as bolts, adhesives, Velcro, clamps, grips, screws, nails, magnets, suction cups, and any and all related components, such as washers and nuts.

Contemplated base assemblies and base assembly systems comprise a plurality of receiving members, such as reinforced tubes or channels, that effectively and efficiently allow a transfer device, such as a fork lift or other lifting device, to couple with the base assembly system such that the base assembly system and load component can be simultaneously lifted, moved and or otherwise relocated. Receiving members are designed as a "female mate to a "male" portion of a transfer/lifting device or apparatus, in that the male portion couples inside of the female receiving member. Receiving members are coupled to the frame system by any suitable device or apparatus, such as those coupling devices previously mentioned. Furthermore, the plurality of receiving members may be placed at any suitable location on the frame system, as long as the receiving members are positioned to receive at least part of the lifting mechanism of the fork lift or other lifting device, equipment or machinery. Another contemplated frame system is similar to that shown in Figure 3 except that there are two additional parallel receiving members that are perpendicularly situated to receiving members 230. This configuration allows for easy placement of the base assembly-load component couple without worrying about keeping the receiving members open to be utilized. If another load component is placed on the side with one set of receiving members, the other set of receiving members can be utilized to lift and transport the base assembly-load component couple. This configuration works well with frame systems having more than four sides, such as the square, rectangular or hexagonal frame systems. It should

be understood that there may be sets of two parallel receiving members where each set is situated at about a 30 degree angle, about a 45 degree angle or about a 60 degree angle from another set of parallel receiving members. These examples show the flexibility at which the sets of parallel receiving members can be situated on or in a frame system.

Reinforcements or reinforcing devices or apparatus to the receiving members comprise interlocking support structures, bolted or otherwise coupled beams or support bars and/or any other suitable structural arrangement that allows for the receiving members to be a) effectively coupled to the load component and b) sufficient support – when coupled with the reinforcing apparatus or scheme – for the load component at a specific indoor and/or outdoor site or location.

Contemplated base assemblies also comprise at least one coupling apparatus which is designed to couple the base assembly to a load component. As already mentioned, holes can be drilled or otherwise formed in the frame system and the load component and nut/bolt/washer assemblies can be used as the coupling apparatus to couple the base assembly to the load component. In a more specific example, holes and corresponding match holes are punched, drilled or otherwise formed in the beams of the frame assembly and a portion of the load component. A sheer, such as a ¼" sheer, with a bolt is placed in each hole. The bolt mates up with a PEM® nut that is placed at the corresponding match hole. The ¼" sheer controls the compression of the gasket. As used herein, a PEM® nut or PEM® fastener are specific fasteners that can also be described as a self-clinching fastener, a captive fastener or a threaded insert. This method of mating and attaching components ensures that there will be little to no damage to the gasket in the field and also ensures that the compression can be controlled within a desired specification. Insulating tape or another method of insulation can also be coupled to the frame system at the coupling interface, if needed. These coupling apparatus are similar to and include those described in PCT Application Serial No.: PCT/US02/34800 filed on October 30, 2002, which is commonly owned and incorporated herein in its entirety.

In some other embodiments, it is contemplated that the "coupling apparatus" could be the weight of the load component. For example, the load component may rest on the base assembly, and by virtue of its weight and shape, the load component may be very stable and may not need additional coupling apparatus to keep it coupled to the base assembly. It is also

contemplated that the "at least one coupling apparatus" may comprise any combination of the coupling methods and apparatus described herein.

A load component may comprise any suitable piece of equipment or collection of materials that a) needs to be or should be stored off of the ground or underlying surface; b) is at least once or occasionally moved/relocated; c) cannot be easily moved or relocated without an underlying support system, such as a pallet. Contemplated load components comprise remote access enclosure systems, remote enclosure systems, radio-equipment cabinets and enclosures and other types of similar systems and enclosures, and equipment and materials used in the wine, beer, liquor or food processing industries, chemical industry and/or pharmaceutical industry.

Any of these load components may comprise any number of electronic and/or semiconductor components. As used herein, the term "electronic component" also means any device or part that can be used in a circuit to obtain some desired electrical action. Electronic components contemplated herein may be classified in many different ways, including classification into active components and passive components. Active components are electronic components capable of some dynamic function, such as amplification, oscillation, or signal control, which usually requires a power source for its operation. Examples are bipolar transistors, field-effect transistors, and integrated circuits. Passive components are electronic components that are static in operation, i.e., are ordinarily incapable of amplification or oscillation, and usually require no power for their characteristic operation. Examples are conventional resistors, capacitors, inductors, diodes, rectifiers and fuses.

Electronic components contemplated herein may also be classified as conductors, semiconductors, or insulators. Here, conductors are components that allow charge carriers (such as electrons) to move with ease among atoms as in an electric current. Examples of conductor components are circuit traces and vias comprising metals. Insulators are components where the function is substantially related to the ability of a material to be extremely resistant to conduction of current, such as a material employed to electrically separate other components, while semiconductors are components having a function that is substantially related to the ability of a material to conduct current with a natural resistivity

between conductors and insulators. Examples of semiconductor components are transistors, diodes, some lasers, rectifiers, thyristors and photosensors.

Electronic components contemplated herein may also be classified as power sources or power consumers. Power source components are typically used to power other components, and include batteries, capacitors, coils, and fuel cells. Power consuming components include resistors, transistors, ICs, sensors, and the like.

Still further, electronic components contemplated herein may also be classified as discreet or integrated. Discreet components are devices that offer one particular electrical property concentrated at one place in a circuit. Examples are resistors, capacitors, diodes, and transistors. Integrated components are combinations of components that that can provide multiple electrical properties at one place in a circuit. Examples are ICs, i.e., integrated circuits in which multiple components and connecting traces are combined to perform multiple or complex functions such as logic.

Telecommunications components include fiber optic cable and other optical materials, such as waveguides, data transmission wires and lines, copper wire, coax cable, keyboards and monitors and the like.

As mentioned, the load component may also comprise equipment and/or materials that may be used in the wine, beer, liquor or food processing industries, such as vats, barrels, drums, starting materials, refrigerators, ice, etc. The load component may also comprise equipment and/or materials that may be used in the chemical and/or pharmaceutical industries, such as vats, mixing drums, refrigerators, starting materials, finished product, etc.

The base assembly system may comprise any suitable material based on the requirements of the base assembly with respect to a) the load component to be coupled, b) the cost and availability of materials, c) the environment into which the base assembly and load component will be placed and/or stored, d) the requirements of the manufacturer, and e) any other suitable requirements, such as local, state and/or federal regulations, heat dissipation needs, and insulation needs.

Some contemplated embodiments are formulated out of non-corrosive steel, however, any suitable metal, alloy, composite material, polymer or plastic material, fiberglass or appropriate or suitable material or combination of materials may be used, as long as the

material or materials is/are capable of successfully and efficiently meeting the needs of the base assembly system with respect to the load components, such as the enclosure system or cabinet system, as described above. As used herein, the term "metal" means those elements that are in the d-block and f-block of the Periodic Chart of the Elements, along with those elements that have metal-like properties, such as silicon and germanium. As used herein, the phrase "d-block" means those elements that have electrons filling the 3d, 4d, 5d, and 6d orbitals surrounding the nucleus of the element. As used herein, the phrase "f-block" means those elements that have electrons filling the 4f and 5f orbitals surrounding the nucleus of the element, including the lanthanides and the actinides. Preferred metals include titanium, silicon, cobalt, copper, nickel, zinc, vanadium, aluminum, chromium, platinum, gold, silver, tungsten, molybdenum, cerium, promethium, and thorium. More preferred metals include titanium, silicon, copper, nickel, platinum, gold, silver and tungsten. Most preferred metals include titanium, silicon, copper and nickel. The term "metal" also includes alloys, metal/metal composites, metal ceramic composites, metal polymer composites, as well as other metal composites.

A load assembly that comprises a base assembly and a load component may be produced by a) providing a base assembly, such as those described herein; b) providing a load component; and c) coupling the base assembly and the load component. A "load assembly" as used herein means an assembly that comprises a base assembly and a load component, such as those described herein. The steps of providing a base assembly and/or a load component may comprise a) ordering the base assembly and/or load component from an outside source; b) producing the base assembly and/or load component in house; or c) a combination thereof.

A load assembly that comprises a base assembly and a load component may be used by a) using a base assembly, such as those described herein; b) using a load component; and c) coupling the base assembly and the load component.

Base assembly systems contemplated herein also offer at least one of the following benefits/advantages (which are not necessarily intended to be objects of the invention):

a. Load components can be assembled at any location and easily transported to the remote site or alternative location.

b. The overall field installation process can be expedited with the major work steps being completed before the field installation process begins.

c. Environmentally controlled work spaces can be effectively utilized before the load component is moved to another site that may not be environmentally controlled.

d. Costs of remote assembly and field installation can be minimized.

e. Load components are provided with a stable base that can support the system and can also provide for easy lifting and relocation.

In some cases, the base assembly systems contemplated herein will comprise two or more of the benefits and advantages listed above, but it should be appreciated that base assembly systems contemplated herein may only comprise one of the benefits/advantages shown above, and that in no way limits the inherent usefulness of the base assembly system.

Thus, specific embodiments and applications of compositions and methods to construct and produce base assembly systems have been disclosed. It should be apparent, however, to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms "comprises" and "comprising" should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced.